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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,891	10/31/2005	Jerome Assal	004501-804	5889

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EXAMINER	
CHU, CHRIS C	

ART UNIT	PAPER NUMBER
2815	

NOTIFICATION DATE	DELIVERY MODE
03/31/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/524,891	ASSAL ET AL.	
	Examiner	Art Unit	
	CHRIS C. CHU	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/31/05 & 2/16/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Preliminary Amendment

1. Applicant's preliminary amendment filed on February 16, 2005 has been received and entered in the case.

Claim Objections

2. Claim 1 is objected to because of the following informalities:

(A) In claim 1, line 3, "a first and a second main electrode" should be --a first and a second main electrodes--.

(B) In claim 1, line 4, "a first and second main connection" should be --a first and a second main connections--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 – 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(A) In claim 1, lines 7 – 9, it is unclear what applicant regards as "it being possible for a eutectic to be formed between the alloying partner and the semiconductor

material". Specifically, the term "possible" in the claim is not clear because it fails to point out what is included or excluded by the claim language. Thus, this claim is an omnibus type claim. Furthermore, Fig. 1 of instant invention clearly shows that the contact lamina is not directly attached to the semiconductor substrate. Thus, it is not clear how the alloying partner within the contact lamina forms an eutectic layer between the alloying partner and the semiconductor material.

(B) In claim 1, lines 15 and 16, "the external contact area" lacks antecedent basis.

(C) In claim 2, line 3, the term "substantially" is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

(D) Dependent claims 2 – 6 do not rectify the deficiency of claim 1 and therefore are similarly rejected.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1 – 3, 5 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Kodama et al. (U. S. Pat. No. 6,686,658).

Regarding claim 1, Kodama et al. discloses in e.g., Fig. 7 a power semiconductor module (the module in e.g., Fig. 7) comprising

- at least one semiconductor chip (11; column 8, line 59) made of a semiconductor material (Si; column 8, line 65) and having a first (the emitter electrode at the upper side of the substrate; column 8, lines 59 – 61) and a second (the collector electrode at the lower side; column 8, lines 61 and 62) main [electrode] --electrodes--,
- a first (4; column 4, lines 56 and 57) and second (5; column 4, lines 56 and 57) main [connection] --connections--,
- a contact lamina (13; column 9, line 5) in electrical contact with the first main electrode (the emitter electrode at the upper side of the substrate) and the first main connection (4; see e.g., Fig. 7),
- the contact lamina (13) containing an alloying partner (AgW, etc.; column 11, line 64 – column 12, line 7), and it being possible for a eutectic to be formed between the alloying partner and the semiconductor material (applicant clearly states that between the Si substrate and Ag alloying partner forms a eutectic, see page 6, lines 4 – 8 of the specification of instant invention. Since Kodama et al. discloses the same materials as instant invention, hence the alloying partner within the contact lamina of Kodama et al. is possible for a eutectic to be formed between the alloying partner and the semiconductor material),

- the contact lamina (13) being coated with an electrically conductive protective layer (15 and 16; column 9, lines 8 – 17 and see e.g., Fig. 7),

wherein

- the protective layer (15 and 16) has at least one electrically conductive base layer (15) applied on the contact lamina (13; see e.g., Fig. 7), and
- an electrically conductive surface layer (16), which forms the external contact area (the area that contacts with the element 4; see e.g., Fig. 7),

and in that

- the base layer (15; Au layer, column 9, line 12) and the surface layer (16; Ni, column 9, line 14) substantially comprise different materials (column 9, line 12 and column 9, line 14).

Regarding claim 2, Kodama et al. discloses in e.g., Fig. 7 the base layer (15; column 9, line 12 and column 9, line 47) "substantially" comprising Ni (column 18, lines 28 – 30) and preferably having a thickness of between approximately 1 μm and 15 μm, preferably between 2 μm and 8 μm (column 9, lines 52 – 53).

Regarding claim 3, Kodama et al. discloses in e.g., Fig. 7 the surface layer (16) having a thickness of between approximately 0.1 μm and 5 μm (column 9, lines 14 – 17).

Regarding claim 5, Kodama et al. discloses in e.g., Fig. 7 the semiconductor chip (11) internally having an IGBT structure (column 8, line 59) or a diode structure.

Regarding claim 6, Kodama et al. discloses in e.g., Fig. 7 the base layer (15) comprising a good covering material (column 9, lines 12 – 14 and see e.g., Fig. 7), and in that the surface layer (16) comprises a material having one or more of the following properties:

a non-oxidizable, preferably exhibiting little chemical reactivity (column 13, lines 2 – 5),

b does not react chemically with a first electrode metallization of the first main electrode and exhibits neither contact corrosion nor material diffusion,

c has a low coefficient of friction,

d can be deposited at temperatures at which the contact layer is not damaged or deformed.

Allowable Subject Matter

7. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(A) Claim 4 contains allowable subject matter because none of references of record teach or suggest, either singularly or in combination, at least the limitation of a surface layer substantially comprises Ru, an electrically conductive intermediate layer being provided between the surface layer and the base layer, said intermediate layer substantially comprising Au and preferably having a thickness of approximately 0.2 μm, and the base layer preferably has a thickness of between 5 μm and 12 μm.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. Kurihara et al., Teshima, Nakamura et al., Kodama et al., Lang et al., Hirao et al., Kimura et al. and Mamitsu et al. disclose a semiconductor device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRIS C. CHU whose telephone number is (571)272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Tuesday, March 25, 2008